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International Conference

Geometric and Algebraic Methods in Mathematical Physics

March 16-19, 2015
Dortmund, Germany

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International Conference

Geometric and Algebraic Methods in Mathematical Physics

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Abstracts

The section Differential Geometry
Faculty of Mathematics
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likes to welcome you to

GAMMP 2015

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Frank Klinker
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Technische Universität Dortmund
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Abstracts

G-structures and their remarkable spinor fields

Ilka Agricola

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Abstract. In this talk, I will describe how several interesting G-structures on Riemannian manifolds (in particular almost contact structures, 3-contact structures, $SU(3)$-structures, and G_2-structures) can be described in a systematic way through remarkable spinor fields and field equations that they satisfy – generalizing the well-known equations for Riemannian Killing spinors, generalized Killing spinors, Killing spinors with torsion, and quasi-Sasakian Killing spinors. Applications include eigenvalue estimates for Dirac operators with skew torsion, cone constructions for G-manifolds admitting a characteristic connection, and embedding theorems for hypersurfaces.

On the longtime behavior of homogeneous Ricci flows

Christoph Boehm

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Abstract. In this talk, we will report on recent results on the Ricci flow on homogeneous spaces: For instance, we will show that a homogeneous Ricci flow solution with finite extinction time develops a Type I singularity. This applies in particular to compact homogeneous spaces different from a torus. For immortal homogeneous Ricci flow solutions we will show that they develop a Type III singularity.

The supersymmetric nonlinear sigma model as a geometric variational problem

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Abstract. We will study the functional of the full supersymmetric nonlinear sigma model from the point of view of differential geometry and global analysis. In this framework we will discuss geometric and analytic properties of its critical points which correspond to the classical equations of motion in physics.

On the center of mass in general relativity

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Abstract. In many situations in Newtonian gravity understanding the motion of the center of mass of a system is key to understanding the general trend of the motion of the system. It is thus desirable to also devise a notion of center of mass with similar properties in general relativity. However, while the definition of the center of mass via the mass density is straightforward in Newtonian gravity there is a priori no definitive corresponding notion in general relativity. Instead, there are several alternative approaches to defining the center of mass of a system. We will discuss these different approaches for both asymptotically Euclidean (isolated) and asymptotically hyperbolic (collapsing) systems and present some explicit (counter-)examples.

Boundary behaviour of Hitchin and hypo flows with left-invariant initial data

Vicente Cortés

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Abstract. Hitchin and hypo flows constitute a system of first order PDEs for the construction of Ricci-flat Riemannian metrics of special holonomy in dimensions six, seven, and eight. Assuming that the initial geometric structure is left-invariant we study whether the resulting Ricci-flat manifolds can be extended in a natural way to complete Ricci-flat manifolds. This talk is based on joint work with Florin Belgun, Marco Freibert, and Oliver Goertsches, see arXiv:1405.1866 (math.DG)

On asymptotic invariants of asymptotically hyperbolic manifolds

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Abstract. Asymptotically hyperbolic manifolds are non compact manifolds that naturally arise in general relativity when one wishes to study isolated systems. One can attach to some of them the 'mass' which behaves nicely under transformations that preserve the asymptotic behavior of the metric. In a joint work with Mattias Dahl and Romain Gicquaud we aim at finding and classifying all such quantities. I will sketch the method; it deals with the action on the set of asymptotically hyperbolic metrics of the group of elements that preserve the hyperbolic space.

Star products on graded manifolds and deformations to Courant algebroids from string theory

Andreas Deser

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Abstract. Deformations of Courant algebroids are of interest in both, physics and mathematics. It was realized by Roytenberg that Lie bialgebroids and the corresponding Courant algebroids can be characterized by a homological vector field on the parity reversed underlying Lie algebroid, leading to the notion of the Drinfel'd double of a Lie bialgebroid. In a similar way, we show that the so-called C-bracket, a bi-linear operation governing the gauge algebra of double field theory, can be characterized with the help of the Poisson structure on the Drinfel'd double of the underlying Lie bialgebroid. Using this result we are able to apply a graded version of the Moyal-Weyl star product to compute the first order deformation of the C-bracket by evaluating the star-commutator. Remarkably, these coincide with the first order corrections in the string coupling parameter found recently in string theory.

Circle-Invariant Instantons, Monopoles and their Moduli Space

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Abstract. The L^2-metric on the moduli space of hyperbolic monopoles is known to be divergent, however hyperbolic monopoles can be equivalently considered as a circle-invariant instantons defined on the four-sphere. The latter have a finite L^2-metric which is examined in this talk in the simplest case of one instanton.

SU(4) holonomy via the Hitchin and hypo flow on Lie algebras

Marco Freibert

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Abstract. Hitchin's flow equations in seven dimensions are PDEs for 1-parameter families of cocalibrated G_2-structures whose solutions define eight dimensional Riemannian manifolds with holonomy contained in $Spin(7)$. In general, this holonomy is not equal to $Spin(7)$ but may reduce further to a subgroup of $SU(4)$. In this case, the Riemannian manifold can be understood as being obtained by the so-called hypo flow of a 1-parameter family of hypo $SU(3)$-structures underlying the mentioned 1-parameter family of cocalibrated G_2-structures.

In this talk, we will study these flows in the left-invariant setting on a Lie group. We will show that the Hitchin flow on an almost abelian Lie algebra can always be reduced to the hypo flow and so gives us always Riemannian manifolds with holonomy contained in $SU(4)$. We will also show that this Riemannian manifold cannot have irreducible holonomy $Sp(2)$. Moreover, we present some other conditions on the initial hypo $SU(3)$-structure on a Lie algebra such that the hypo flow yields Riemannian manifolds with holonomy even equal to $SU(4)$.

Classification of naturally reductive spaces

Thomas Friedrich

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Abstract. We present a new method for classifying naturally reductive homogeneous spaces – i. e. homogeneous Riemannian manifolds admitting a metric connection with skew torsion that has parallel torsion *and* curvature. This method is based on a deeper understanding of the holonomy algebra of connections with parallel skew torsion on Riemannian manifolds and the interplay of such a connection with the geometric structure on the given Riemannian manifold. It

allows to reproduce by easier arguments the known classifications in dimensions three, four, and five (Kowalski et el 1985), and yields as a new result the classification in dimension six. In each dimension one obtains a 'hierarchy' of degeneracy for the torsion form which we then treat case by case. For the completely degenerate cases we obtain results that are independent of the dimension. In some situations we are able to prove that any Riemannian manifold with parallel skew torsion has to be naturally reductive.

Classification problem for pseudo-Riemannian holonomy groups

Anton Galaev

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Abstract. The classification of the holonomy algebras (equivalently, of the connected holonomy groups) of Riemannian manifolds is a well-known result, which has many consequences and applications in geometry and physics. This motivates the classification problem for the holonomy algebras of pseudo-Riemannian manifolds of arbitrary signature. The complete solution is obtained only for Lorentzian manifolds by L. Berard-Bergery, A. Ikemakhen, T. Leistner and me. I will discuss this classification and some of its applications. Then I will discuss the partial results in other signatures: my results about the holonomy algebras of pseudo-Kaehlerian manifolds of signature $(2, 2n)$; results of N. Bezvitnaya about the holonomy algebras of pseudo-hyper-Kaehlerian manifolds of signature $(4, 4n)$ and of the holonomy algebras of pseudo-quaternionic-Kaehlerian manifolds of arbitrary signature; the results of L. Berard-Bergery and A. Ikemakhen about the holonomy algebras of pseudo-Riemannian manifolds of the neutral signature. In the last part of the talk I will present two of my general results for pseudo-Riemannian manifold of arbitrary signature. The first result shows that there cannot be a classification in the arbitrary signature, since the holonomy algebra of a pseudo-Riemannian manifold of signature $(r + 2, s + 2)$ may contain an arbitrary subalgebra of $\mathfrak{so}(r, s)$. The second result gives an unexpected classification of the holonomy algebras of the non-vacuum Einstein pseudo-Riemannian manifolds of arbitrary signature.

On holonomy groups of Weyl connections

Jonas Grabbe

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Abstract. A conformal structure on a manifold is said to be a conformal product structure if it admits two conformal submersions with orthogonal fibres intersecting transversally. Motivated by this notion, we classify the possible holonomy groups of Weyl connections. The Berger-Simons theorem and the Merkulov-Schwachhöfer classification of holonomy groups of irreducible torsion-free connections leaves us with the remaining case where the Weyl connection is reducible and non-closed. In this case, Florin Belgun and Andrei Moroianu showed that the Weyl structure is a Weyl structure of a non-closed conformal product.

The L^p-spectrum of the Dirac operator on hyperbolic space and applications

Nadine Grosse

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Abstract. We determine the spectrum of the Dirac operator as an operator from L^p to L^p on the hyperbolic space and on products of the hyperbolic space with compact manifolds. The spectrum is no longer real in general; for example for the hyperbolic space it is a strip around the real axis. This spectrum is helpful for applications in conformal geometry and for solving non-linear PDEs. We obtain positive and negative results about the validity of Hijazi-type inequalities on non-compact manifolds, and we derive estimates for spinorial Yamabe-type invariants (Joint work with Bernd Ammann, Regensburg). The contents of the first part of the talk is covered in arXiv:1405.2830.

Supergeometry in locally covariant quantum field theory

Florian Hanisch

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Abstract. The framework of locally covariant QFT provides a rigorous axiomatic set-up for the formulation of classical and quantum field theories in curved space-time. Within this setting theories are described by functors from a suitable category of space-times to a category of algebras of observables. In this talk we will extend this concept to include certain supersymmetric theories which may be defined in terms of supergeometric structures on space-time. Starting from a category SLoc of super-Cartan manifolds, we will show that it is not difficult to construct a functor $A : \mathrm{SLoc} \to \mathrm{S}{*}\mathrm{Alg}$ into the category of super-$*$-algebras, which can be interpreted as free super-quantum field theory. However, it turns out that this naive construction does not capture supersymmetry transformations because these do not arise as ordinary morphisms of supermanifolds but rather as higher points of a superset of morphisms. We will show how to include these supersets in the locally covariant framework using the concepts from enriched category theory and eventually arrive at supersymmetric field theories. The formalism will be illustrated with the help of examples. The talk is based on joint work with Thomas-Paul Hack and Alexander Schenkel.

Compact and asymptotically cylindrical 8-manifolds with holonomy $\mathrm{Spin}(7)$

Alexei Kovalev

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Abstract. We construct examples of asymptotically cylindrical Riemannian eight-manifolds with holonomy group $Spin(7)$. To our knowledge, these are the first such examples. The construction uses an extension to the asymptotically cylindrical setting of Joyce's existence result for torsion-free $Spin(7)$-structures. One source of

examples arises from 'Fano-type' Kähler four-orbifolds with smooth anticanonical Calabi-Yau 3-fold divisors and with compatible anti-holomorphic involution. We also develop a generalized connected sum construction of compact $Spin(7)$-manifolds from asymptotically cylindrical pairs. This produces a 'pulling-apart' deformation of a compact $Spin(7)$-manifold constructed by Joyce as well as topologically new examples.

Deformation of Lagrangian submanifolds in strict nearly Kähler 6-manifolds

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Abstract. Lagrangian submanifolds in strict nearly Kähler 6-manifolds are related to special Lagrangian submanifolds in Calabi-Yau 6-manifolds and coassociative cones in G_2-manifolds. The subjects are studied by many mathematicians and physicists from different angles. In my talk I shall briefly review motivations of the problem of Lagrangian deformations of Lagrangian submanifolds in strict nearly Kähler six-manifolds and report new results obtained in our joint work with Lorenz Schwachhöfer. Especially, I shall explain the reduction of the considered deformation problem in the smooth category to the deformation problem in the real analytic category. A part of my talk is based on our preprint arXiv:1408.6433.

Disconnecting the G_2-moduli space

Johannes Nordström

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Abstract. The ν-invariant of a G_2-structure on a closed seven-manifold M is an element of Z_{48} defined in terms of the signature and Euler characteristic of a coboundary with a $Spin(7)$-structure. I will describe how ν can be computed analytically in terms of η-invariants on M, and how to use this to find examples where the moduli space of holonomy G_2 metrics on M is disconnected. This is joint work in progress with Diarmuid Crowley and Sebastian Goette.

$\mathrm{Spin}(9)$, Fourth Severi variety, Rosenfeld planes and Clifford structures

Maurizio Parton

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Abstract. The Fourth Severy variety is the Hermitian symmetric space $EIII = E6/(Spin(10).U(1))$, appearing in F. Zak's classification of smooth projective varieties which, in spite of their low codimensions, are unable to fill their ambient projective spaces through their secant and tangent lines. The Rosenfeld projective planes are the Riemannian symmetric spaces *EIII*, *EVI*, *EVIII*. They have been proposed by Rosenfeld as an extension of the octonionic projective plane. Clifford structures were introduced by A. Moroianu and U. Semmelmann, and can be viewed as extending the notion of almost complex and almost quaternionic structures.
The Lie group $Spin(9)$ can be seen as a subgroup of $SO(16)$ generated by nine involutions. Starting from these nine involutions I will sketch out how $Spin(9)$ is related with the Fourth Severy variety, the Rosenfeld projective planes, and Clifford structures.

Resonance for loop homology of spheres

Hans-Bert Rademacher

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Abstract. Using variants of the Chas-Sullivan product on the homology of the free loop space we derive resonance statements for closed geodesics on spheres. This is joint work with Nancy Hingston.

On the mass of asymptotically hyperbolic initial data sets

Anna Sakovich

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Abstract. In this talk, we will focus on asymptotically hyperbolic initial data for the Einstein equations of general relativity. These objects arise naturally as hypersurfaces asymptotic to null cones in asymptotically Minkowskian spacetimes. In this case an asymptotic invariant called mass can be defined, its properties being similar to those of ADM mass of asymptotically Euclidean initial data. We will discuss perturbations which improve certain properties of asymptotically hyperbolic initial data while changing the mass arbitrarily little and will outline some recent progress towards the proof of positive mass conjecture in the asymptotically hyperbolic setting.

Differential geometric aspects of topological quantum field theories and related geometric structures

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Abstract. After recalling Atiyah's axioms of a topological quantum field theory, we discuss the geometric equations describing the deformations thereof, called the tt^*-equations. Before we focus on nearly Kähler manifolds as a special class of solutions, we show that these geometries coincide with a certain class of pluriharmonic maps.

An algebraic-geometric method to solve classical classification problems in the theory of integrable systems

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Abstract. We present an abstract, algebraic-geometric method to solve a system of nonlinear partial differential equations which is algebraic in its unknowns and their derivatives, provided this solution also satisfies some overdetermined linear partial differential equation. We then give two concrete examples where this method can be applied successfully. In the first example, the classification of separable systems, this method reveals new and surprising algebraic-geometric structures behind the well-known classification. In the second example, the classification of superintegrable systems, this method is expected to accomplish the currently incomplete classification.

Subriemannian Metrics and some Parabolic Geometries

Jan Slovak

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Abstract. The talk will report on work in progress, a joint project of David M. J. Calderbank, Vladimir Soucek and myself, devoted to the exploitation of the classical linearization principle known from the projective metrizability problem. In the realm of parabolic geometries, this leads to the quest for subriemannian metric partial connections within the class of the Weyl structures on a given parabolic geometry. I shall pay particular attention to the class of parabolic geometries with the irreducible defining distributions (i.e. one cross, or exceptionally two crosses, in the corresponding Satake diagram), focusing on some particular examples.

Instantons on Cones and Sine-Cones over Sasakian manifolds

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Abstract. We investigate instantons on conical $(n+1)$-manifolds constructed from Sasaki-Einstein and 3-Sasakian n-manifolds. First, concerning the geometry of the conical manifolds, we find Kähler-torsion structures over Sasaki-Einstein manifolds and hyper Kähler-torsion structures over 3-Saskian manifolds. In particular, for six dimensions the examples of nearly Kähler, Kähler-torsion and half-flat six-manifolds are considered which are prominent in flux compactifications of string theory. Second, we investigate the instanton equations for Yang-Mills fields in higher dimension and construct an ansatz for the gauge connection that reduces the instanton equations to a set of matrix equations. For these, we present and discuss some solutions

Deformations of Coisotropic Submanifolds in Jacobi Manifolds

Luca Vitagliano

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Abstract. I discuss how to attach an L^∞-algebra to any coisotropic submanifold in a Jacobi manifold à la Kirillov. This construction generalizes and unifies analogous constructions in symplectic, Poisson, and locally conformal symplectic geometry. As a new special case one can attach an L^∞-algebra to any coisotropic submanifold in a (non-necessarily coorientable) contact manifold. The L^∞-algebra of a coisotropic submanifold S governs the (formal) deformation problem of S. This is joint work with Hong Van Le, Yong-Geun Oh, and Alfonso Tortorella.

Hyperbolic Alexandrov-Fenchel inequality

Yong Wei

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Abstract. For any 2-convex and star-shaped hypersurface in hyperbolic space, we prove a sharp Alexandrov-Fenchel type inequality involving the 2nd mean curvature integral and area of the hypersurface. I will start the talk with the motivation of the problem, including an introduction of isoperimetric and Alexandrov-Fenchel inequality in Euclidean space with the recent new proof and applications. Then I state our main result, recent progress, and some open problems. Finally, I will give an overview of the proof: in the strictly 2-convex case the proof relies on an application of Gerhardt's convergence result of inverse mean curvature flow for strictly mean-convex hypersurfaces in hyperbolic space, and sharp Sobolev inequalities on sphere; in the general 2-convex case the proof involves an approximation argument.

Higgs bundles, Prym varieties and limiting configurations

Frederik Witt

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Abstract. In this talk we will discuss a (partial) geometric compactification by limiting configurations of the moduli space of Hitchin's self-duality equations. While the proof is in essence analytic we focus on its algebraic interpretation in terms of Higgs bundles and Prym varieties.

Exact solution of a four-dimensional field theory

Raimar Wulkenhaar

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Abstract. The regularisation of the $\lambda\phi^4_4$-model on a noncommutative geometry gives rise to a quartic matrix model with external matrix. This model is exactly solvable in terms of the solution of a non-linear equation and the eigenvalues of that matrix. The opposite limit of infinite noncommutativity defines Schwinger functions on standard $\mathbb{R}^4$ which satisfy the easy Osterwalder-Schrader axioms growth, covariance and symmetry. We provide numerical evidence for reflection positivity of the 2-point function for a certain range of the coupling constant.

Posters

Local monotonicity for some geometric flows

Ahmad Afuni
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A natural cocalibrated G_2 structure

Rui Albuquerque
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Jacobi and locally conformal symplectic structures

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Curvature properties of the Kähler/Kähler-correspondence

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Complete quaternionic Kähler metrics from the q-map and the HK/QK correspondence

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Homogeneous cosmological models

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On the Einstein flow with positive cosmological constant

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A new approach to classifying naturally reductive spaces

Reinier Storm
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Euclidean Supergravity

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Invariant commutative n-ary superalgebras via derived bracket construction

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Timetable

	Monday	Tuesday	Wednesday		Thursday	
09:00	Registration	Alexei Kovalev	Ilka Agricola		Anton Galaev	09:00
10:00		Thomas Friedrich	Raimar Wulkenhaar		Hans-Bert Rademacher	10:00
10:15	Welcome					
10:30	Frederik Witt					
		Coffee break	Coffee break		Coffee break	11:00
11:30	Christoph Böhm	Vicente Cortés	Jan Slovak		Hong Van Le	11:30
12:30	Lunch break / Registration	Lunch break	Lunch break		Johannes Nordström	12:30
						13:30
14:30	Andreas Deser	Maurizio Parton	Florian Hanisch	Jonas Grabbe	14:30	
15:15	Carla Cederbaum	Nadine Grosse	Volker Branding	Yong Wei	15:15	
16:00	Coffee break	Marco Freibert	Coffee break		16:00	
16:30	Julien Cortier		Lars Schäfer	Luca Vitagliano	16:30	
16:45		Coffee break / Postersession			16:45	
17:15	Konrad Schöbel		Markus Sperling	Anna Sakovich	17:15	
18:00						
18:30	Welcome					
19:00		Conference Dinner				

List of Participants

- Ahmad Afuni, Leibniz Universität Hannover, Germany
- Ilka Agricola, Philipps-Universität Marburg, Germany
- Rui Albuquerque, Universita di Torino, Italy
- Giovanni Bazzoni, Universität Bielefeld, Germany
- Florin Belgun, Universität Hamburg, Germany
- Christoph Böhm, Westfälische Wilhelms-Universität Münster, Germany
- Volker Branding, Vienna University of Technology, Austria
- Lana Casselmann, Universität Hamburg, Germany
- Carla Cederbaum, Universität Tübingen, Germany
- Vicente Cortés, Universität Hamburg, Germany
- Julien Cortier, Max Planck Institute for Mathematics, Bonn, Germany
- Andreas Deser, Leibniz Universität Hannover, Germany
- Peter-Simon Dieterich, Universität Hamburg, Germany
- Malte Dyckmanns, Universität Hamburg, Germany
- Guido Franchetti, University of Cambridge, UK
- Marco Freibert, Aarhus University, Denmark
- Thomas Friedrich, Humboldt-Universität Berlin, Germany
- Anton Galaev, University of Hradec Kralove and Masaryk University Brno, Czech Republic
- Oliver Goertsches, Ludwig-Maximilians-Universität München, Germany
- Jonas Grabbe, Université de Versailles, France
- Josua Groeger, Universität Köln, Germany
- Nadine Große, Technische Universität Dresden, Germany
- Florian Hanisch, Universität Potsdam, Germany
- Jörg Horst, Technische Universität Dortmund, Germany
- Artanc Kayacelebi, Technische Universität Dortmund, Germany
- Panagiotis Konstantis, Universität Marburg, Germany
- Alexei Kovalev, University of Cambridge, UK
- Margarita Kraus, Johannes Gutenberg Universität Mainz, Germany
- Klaus Kröncke, Universität Regensburg, Germany
- Wolfgang Kühnel, Universität Stuttgart, Germany

- Philip Kupper, Universität Leipzig, Germany
- Hong Van Le, Institute of Mathematics of Academy of Sciences, Czech Republic
- Ute Löw, Technische Universität Dortmund, Germany
- Thomas Madsen, Scuola Normale Superiore di Pisa, Italy
- Marc Nardmann, Technische Universität Dortmund, Germany
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- Anna Sakovich, Max Planck Institute for Gravitational Physics, Potsdam, Germany
- Lars Schäfer, Leibniz Universität Hannover, Germany
- Konrad Schöbel, Friedrich-Schiller-Universität Jena, Germany
- Thomas Skill, Hochschule Bochum, Germany
- Günter Skoruppa, Technische Universität Dortmund, Germany
- Jan Slovak, Masaryk University Brno, Czech Republic
- Marcus Sperling, Universität Hannover, Germany
- Joachim Stöckler, Technische Universität Dortmund, Germany
- Reinier Storm, Philipps-Universität Marburg, Germany
- José Vasquez, Max Planck Institute for Mathematics in the Sciences, Leipzig, Germany
- Owen Vaughan, Universität Hamburg, Germany
- Elizaveta Vishnyakova, Max Planck Institute for Mathematics, Bonn, Germany
- Luca Vitagliano, University of Salerno, Italy
- Yong Wei, University College London, UK
- Frederik Witt, Westfälische Wilhelms-Universität Münster, Germany
- Raimar Wulkenhaar, Westfälische Wilhelms-Universität Münster, Germany

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International Conference on Geometric and Algebraic Methods in Mathematical Physics

GAMMP 2015

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invited speakers

Ilka Agricola
Christoph Böhm
Vicente Cortes
Thomas Friedrich
Anton Galaev
Alexei Kovalev
Hong Van Le
Johannes Nordström
Hans-Bert Rademacher
Jan Slovak
Frederik Witt
Raimar Wulkenhaar

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2015-01 **Frank Klinker**
Program of the International Conference
Geometric and Algebraic Methods in Mathematical Physics
March 16-19, 2015, Dortmund

2014-10 **Frank Klinker**
An explicit description of SL (2, ℂ) in terms of $SO^+(3, 1)$ and vice versa

2014-09 **Margit Rösler and Michael Voit**
Integral representation and sharp asymptotic results for some Heckman-Opdam hypergeometric functions of type BC

2014-08 **Martin Heida and Ben Schweizer**
Stochastic homogenization of plasticity equations

2014-07 **Margit Rösler and Michael Voit**
A central limit theorem for random walks on the dual of a compact Grassmannian

2014-06 **Frank Klinker**
Eleven-dimensional symmetric supergravity backgrounds, their geometric superalgebras, and a common reduction

2014-05 **Tomáš Dohnal and Hannes Uecker**
Bifurcation of nonlinear Bloch waves from the spectrum in the Gross-Pitaevskii equation

2014-04 **Frank Klinker**
A family of non-restricted $D = 11$ geometric supersymmetries

2014-03 **Martin Heida and Ben Schweizer**
Non-periodic homogenization of infinitesimal strain plasticity equations

2014-02 **Ben Schweizer**
The low frequency spectrum of small Helmholtz resonators

2014-01 **Tomáš Dohnal, Agnes Lamacz, Ben Schweizer**
Dispersive homogenized models and coefficient formulas for waves in general periodic media

2013-16 **Karl Friedrich Siburg**
Almost opposite regression dependence in bivariate distributions

2013-15 **Christian Palmes and Jeannette H. C. Woerner**
The Gumbel test and jumps in the volatility process

2013-14 **Karl Friedrich Siburg, Katharina Stehling, Pavel A. Stoimenov, Jeannette H. C. Wörner**
An order for asymmetry in copulas, and implications for risk management

2013-13 **Michael Voit**
Product formulas for a two-parameter family of Heckman-Opdam hypergeometric functions of type BC

2013-12 **Ben Schweizer and Marco Veneroni**
Homogenization of plasticity equations with two-scale convergence methods

2013-11 **Sven Glaser**
A law of large numbers for the power variation of fractional Lévy processes

2013-10 **Christian Palmes and Jeannette H. C. Woerner**
The Gumbel test for jumps in stochastic volatility models

2013-09 **Agnes Lamacz, Stefan Neukamm and Felix Otto**
Moment bounds for the corrector in stochastic homogenization of a percolation model

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